DOCUMENT RESUME

ED 120 992 EC 082 479

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TITLE The Impact of a Day School Program on the Language Development of Autistic Children.
PUB DATE [76]
NOTE 46p.; Paper presented at the American Education Research Association Meeting, Session 11.15

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage
DESCRIPTORS Academic Achievement; *Autism; *Case Studies; Elementary Education; Exceptional Child Education; *Language Development; Motor Development; *Program Descriptions; *Program Effectiveness; Social Development

ABSTRACT

Described is a program for autistic children, and presented are educational case studies of 13 children (6-9 years old). The program is explained to provide individualized instruction based on assessment using the Peabody Individual Achievement Test, B. Ruttenberg and E. Wolf's Vocalization and Expressive Speech Development Scale, L. Lee's developmental Sentence Analysis and Scoring, and Ruttenberg and Wolf's scale for Determining the Nature and Degree of Relationship to an Adult as a Person. Case studies provide information on child progress in language, academic, socialization, and body management skills. It is noted that strategies emphasizing manipulative materials and action-response tasks for nonverbal children appeared more effective in developing language and social learning than reading and writing activities. (CL)

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The Impact of a Day School Program on the Language Development of Autistic Children

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The Cincinnati Public Schools, Special Education Branch, in conjunction with the Cincinnati Center for Developmental Disorders cooperated in the establishment of a school for autistic children. Funded under Title VI, the first class operated during the 1973-74 school year. A second class was added the following year. Historically, autistic children have been excluded from the school. However, recent research has indicated that at least some of the affected children are educable. The public concern that these children be given educational opportunities eventually led to the founding of the school as described above. In this situation, "autistic children" are as defined by the National Society for Autistic Children (1975). Included are infantile autism and related childhood psychoses characterized by severe language and behavioral disturbances.

Faculty. Each class has a head teacher, two teacher assistants. One speech therapist works part-time with one class. Both head teachers have had extensive experience with autistic children in varied settings including state mental health institutions. Teacher assistants are college trained and have worked with handicapped children and adults in educational and recreational programs.

Facilities. One class is housed at the Cincinnati Center for Developmental Disorders in a large, pleasant room arranged in learning centers for academic, arts and crafts, and other activities (Figure 1.). The other class is housed at Schiel school, a typical elementary school. Both classrooms are well

equipped. Each has a "time-out" area for a temporarily disruptive student.

Selection of Students. Students must be six to nine years of age at admission and have severe communication and behavior problems. Each child is evaluated before being admitted to the school. Basic is medical, psychological, psychiatric, speech, and educational assessment.

Individualization of Instruction. Each child is studied by staff and the inter-disciplinary team. Feasible objectives are identified. The set of objectives contain one or more related to self-help skills, academic achievement, social interaction, and language development. Staff reviews the progress of each child weekly and modifies objectives as indicated. The inter-disciplinary team members represent a number of professions, including nursing, pediatrics, psychiatry, psychology, social service, nutrition, and speech and hearing.

School Day. School starts at 9 a.m. and closes at 2 p.m. Each day's schedule includes academic work, art, physical education, music, food preparation, and assorted activities (Table 1).

Objectives. The School was established to determine methodologies for instructing autistic children. Particularly, to identify teacher strategies which promote socialization, language, academic, and sensori-motor development. This report reviews and evaluates progress from September, 1974 through June, 1975. This first section deals with procedures for assessing development with individual student outcomes. The third and final section contains recommendations.

Figure 1

AUTISTIC CLASSROOM

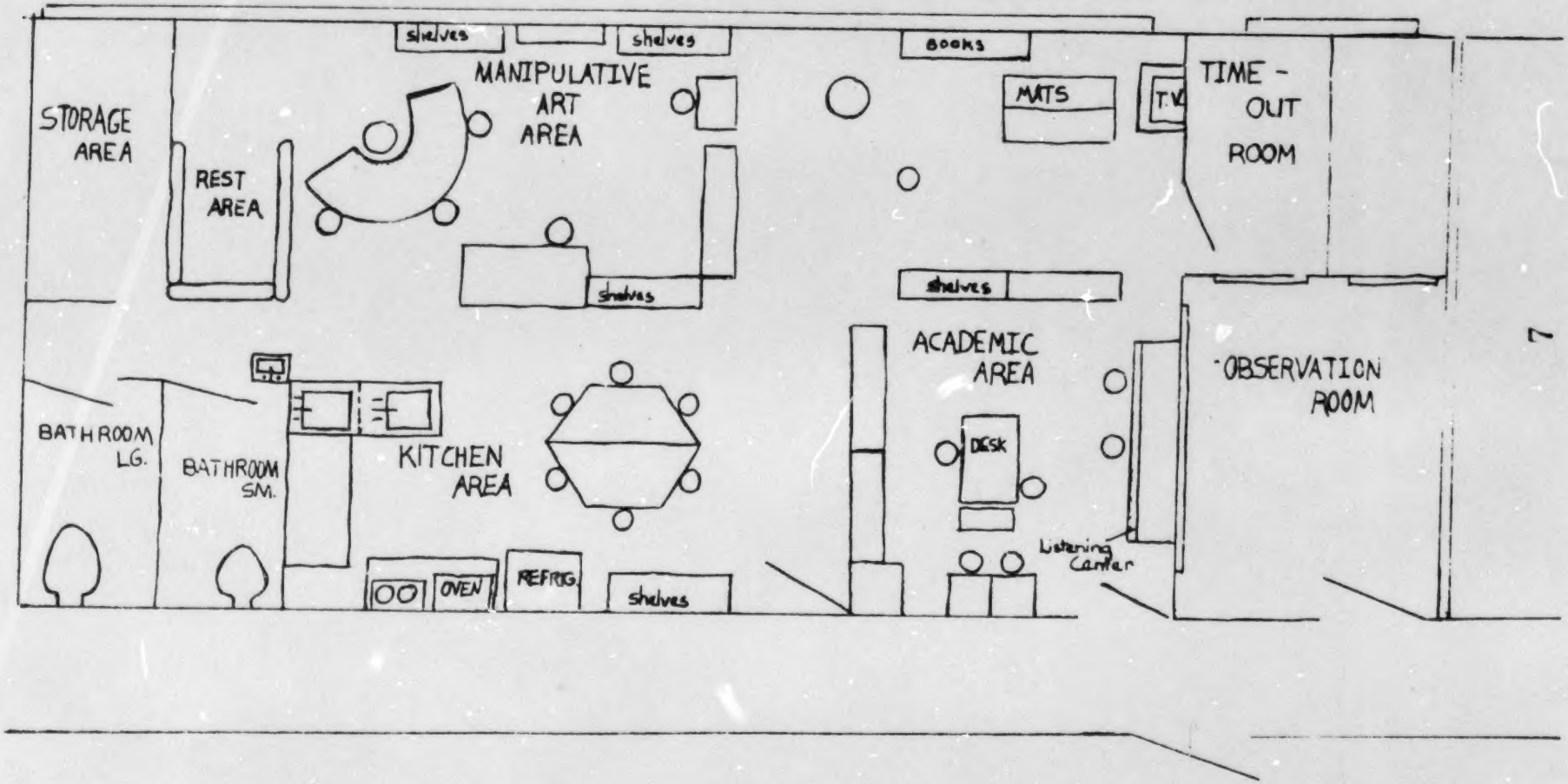

Table 1. Classroom Schedule.

8:30 a.m.	Beginning of schoolday for teaching staff.
8:40-9:15	Children arrive.
9 a.m.	Official beginning of schoolday. 1. Children arrive. 2. Put lunch boxes in place. 3. Take off coats, hats, etc. 4. Hang up same. 5. Brush hair and straighten clothing. 6. Use toilet if necessary.
9-11:45	Academic work and formal language study (leadership of Denise). Food preparation for lunch (leadership of Carolyn). Art (leadership of Michele). Physical education and/or music.
11:15-11:45	Carolyn Austin to lunch.
11:45-12:00	Story time and quiet time (Michele). Setting table for lunch (Carolyn).
12-12:30	Lunch for children (supervised). Relaxation and cleanup.
12-12:30	Michele Roszmann to lunch.
12:30-1:00	Denise Cozart to lunch.
12:30-1:30	Practice in academic work. Art. Physical education and/or music.
1:30-2:00	Children finish activities begun. Supervised cleanup of classroom. Supervised use of toilet. Supervised dressing in preparation for going home.
2 p.m.	Official closing of schoolday.
2-2:20	Children leave for home.
2:30-3:00	In-service session for teaching staff by teaching staff in classroom.
3 p.m.	End of schoolday for teacher assistants.

Procedures

Every child was given one or more trials on the Peabody Individual Achievement Test. Scales from two sources, (a) Ruttenberg and Wolf (1967) and (b) Lee (1974), were used in assessing language development. Another Ruttenberg and Wolf scale was used for assessing relationships with adults.

The Language Sample. All of the intelligible utterances of the child during a three-hour period were recorded in writing by a student teacher or teacher assistant known to the child. Efforts were made by teachers to elicit verbal responses, using any appropriate media. Samples were taken in the fall of 1974 and the spring of 1975. "Vocalization and Expressive Speech Development Scale" (Ruttenberg and Wolf) was designed for use with autistic children. The first nine levels, beginning with the mute child (level 1) and progressing through the appearance of the first person pronoun (level 9), were applied to samples that fell in this range.

Vocalization and Expressive Speech Development Scale

Level	Criteria
1.	Child is essentially nonvocal, although he may grunt, whine, whimper, sigh or cry under tension or distress.
2.	Child produces repetitive sounds which may come at times of exuberance as well as distress and may be autoerotic in nature. Particularly, vowels /a/ and /i/, along with the dipthong /ai/.
3.	Variations of volume, pitch, and intonation are apparent. Consonants /k/, /l/, /g/, and /b/ along with vowels /u/ and /U/ are present.

4. Speech consists of highly developed babbling intermingled with single work-like combinations such as "mama" or "dada."

5. Imitative mirroring of single words or short phrases begins. Echolalic imitation may be immediate or delayed.

6. There is jargon which makes use of the previous levels of expressive speech; often sounds like a foreign tongue.

7. The naming of things and people associated with objectives or activities important to the child.

8. Use of two or three-word utterances such as, "Want a cookie," or "Bye-bye doggie."

9. Use of first person pronoun appears at this level.

Level 9 was extended in light of the presently-accepted psychoanalytic theory in that separation of self from nonself and "I" out of the undifferentiated "You" is a necessary condition for the development of the personal pronouns (Fay, 1971). Expressions such as "I am," or "I see" were taken as evidence of lowest level differentiation of self from nonself and assigned level 9a. Level 9b was reserved for an expression of a primitive need coupled with a satisfaction of the need. The "I" could be implied or spoken; eg., "want juice," or "I want juice." Evidence of possession or manipulation of objects in the environment were assigned 9c; eg., "I move it." Either the "You" pronoun or the naming of other persons was taken as evidence of separation of "I" out of the undifferentiated "You" and assigned 9d. Another frame of reference was needed for consideration of language samples with more sophisticated grammatical constructions.

While complete analysis of the autistic language samples using the Lee techniques would be inappropriate, reference is made to Developmental Sentence Analysis and Developmental Sentence Scoring. The former is for analysis of samples in which less than half the utterances are complete sentences; the latter, if more than half. Developmental sentence scoring has eight scales, five relating to parts of speech, one to wh- questions, another to negatives on the verb forms, and finally to interrogative reversals. Five scales related to three parts of speech critical in language development are: pronouns; personal and indefinite; verbs; main and secondary; and conjunctions. The hierarchy of expressions on each scale are scored from 1 to 7 or 8; eg., personal pronouns (one pronoun selected from Lee's list for each score):

Pronoun	Score
I	1
he	2
we	3
myself	4
whose	5
whichever	7

Language samples from a few children contained expressions listed in the Lee scales. The number in parenthesis following the expression refers to Lee's scale, but no further interpretation is implied.

Relationships. Ruttenberg and Wolf's scale for Determining the Nature and Degree of Relationship to an Adult as a Person were

also used. A brief statement of critical features of the first eight levels follows:

1. Impervious or obliviousness to people. Looks through the person. Persistent attempt of the adult to become involved or even in physical proximity may trigger reactions of diffuse rage or panic.

2. Intermittent withdrawal or imperviousness. Visual following of a person at a distance, but gaze diverted when adult approaches or attends to child.

3. Resistiveness; a continued, but less extreme way of warding off a relationship; features withdrawal of attention and physical avoidance. Child looks past or away from adult.

4. Child attends to a familiar person at a distance of six feet or more. He may venture nearer to the adult when the adult's attention is directed elsewhere, but will physically retreat if adult turns his attention to the child.

5. Brief, sporadic, but recurrent attending to one familiar adult at close range. Typically, this is in conjunction with gratification of primitive needs such as food, relief of tension, or pain.

6. Regularly recurring response to one person. Establishes and maintains eye contact. Explores adult's face visually and manually. Child attempts to grasp the concept of appearing and disappearing, coming and going of the important adult.

7. Consistent searching out and attending to one person for comfort, approval, help, and play. An active relationship is established through reciprocal games and teasing, but things are done on the child's terms.

8. Child is beginning to anticipate approval and disapproval and can control his behavior accordingly. He is regularly responsible to requests and suggestions from a familiar person; for example, to play fetch and carry.

Child 1 -- a Black Male

Language. In the fall sample, Child 1 spoke about once every nine minutes. He was using single words three times as frequently and complete sentences half as frequently as a normal child of two years (Lee, pp. 120). There was evidence of self-nonself

	Single Words	Two-Word Combinations	Constructions	Complete Sentences
Normal Child (2-0 to 2-2)	18%	21%	18%	43%
Child 1	50%	22%	6%	22%

differentiation. "I" was used a total of four times ("I am and "I see," 9a; "I got a big hat" and "I do it," 9c). The repeated appropriate use of the full name of a classmate, the use of "mama," and the sentence, "It's you" (22) indicated I-you differentiation. Further, acceptance of legitimate constraints on behavior was present--"have to get quiet." Also, he used the numeral, "two."

Since the student had a very low level of verbal production (about once every nine minutes), three specific goals related to increased verbalization were selected. The goals were: 1) to increase attending behavior to the face, 2) to increase use of present spontaneous vocabulary, and 3) to elicit a verbal response to a verbal clue. Teacher strategies to increase attending behavior to the face, particularly the mouth, were:

1. Student sits facing the teacher with his legs lightly held between hers. Teacher grasps the chin and directs student's face towards hers and talks or sings to student.

2. Student uses modeling clay, papier mache, and other materials to make pretend eye glasses, hats, noses, moustaches, and face masks. The models are "tried on" with student peering into the "looking glass."

The spontaneous vocabulary included cow, hat, coat, and butter. To promote the use of these words, the student was given jigsaw puzzles of these objects. Each time the student correctly named the object, he was positively reinforced; initially with a candy dot, later, simply with praise. To elicit a verbal respons to a verbal clue, the student was given responsibility for a single word in a poem or song which was recited or sung by the teacher or group; eg., student would sing the "star" in "Twinkle, Twinkle Little Star."

In view of the good self-nonself differentiation, a goal of having the student recognize and produce a symbol representing self was chosen. Particularly, the goal was to have the student recognize and produce the capital letter "S" with appreciation of the letter as a marker or placeholder for self. The letter was made with chalk, felt marker, paints, etc., with the teacher guiding the student's hand repeating that "S" stood for the child's name. The child also cut the letter out of clay and cookie dough. If he selected the "S"-shaped cookie, he was praised; if not, he was given the appropriate cookie. He traced a sand paper letter with his fingers.

Since in the fall language sample he portrayed himself in a manipulative interraction with the environment (I do it), verbs which reflected activity in an area of interest were selected for drill and practice. Every attempt at "open," "take," "roll," and "cut" (playdough, cookiedough, etc.,) was positively reinforced.

Since the numeral "two" appeared in the fall sample, strategies to develop one to one correspondence and enumeration were included in his teaching plan, particularly the Sterne arithmetic blocks and the giant building blocks. With both types of blocks he was encouraged and assisted to build a tower. Then, with the teacher's hand over his, each block was touched and counted by the teacher. Any attempt at counting aloud by the student was rewarded with a candy dot. He was also encouraged to stack and count other items of interest, such as cereal boxes.

The overall objective of increasing verbal production was met. In the spring sample, the student spoke about once every five minutes, as compared to once every nine minutes in the fall sample. Success of the "block stacking and counting" strategy was reflected in the sorting and placing of colored arithmetic blocks in the correct columns of the form board and in the stacking and spontaneous counting of up to six giant blocks. Progress was also made in verbalization, accompanying the manipulative interaction with the enviornment, Child 1 repeating opening, taking, rolling, and cutting. The spring sample contained 22 new nouns. Eight dealt with feeding (milk, apple, butter, water, cookies, ice cream, and bowl), three with body parts (hand, eyes, feet), and three with clothing (shoes, hat, coat). The naming of body parts and clothing may indicate a stronger self image.

Academic. In the fall, it took Child 1 about three minutes to sort the Sterne Arithmetic blocks by color, place them in columns in the form board, and locate the correct numeral at the

top of the column. The teaching strategy was for the teacher to count aloud as the child placed cubes in the formboard and after completion of each board, touch and count each cube holding his hand. Every effort at counting was rewarded. Child 1 now counts with few cues from the teacher.

In the fall, given cutouts of the names of eleven students and teachers in his class, he correctly placed five of them over their outlines in three minutes. Candy reinforcers were used throughout the teaching session. At the listening post, a favorite spot, he would pull a card through the machine as quickly as possible, and immediately reinsert the card; eg., he ran and re-ran the "m for monkey" card as fast as he could for two minutes. Initially, his attention span was between two and five minutes. This was gradually increased principally through storytelling until at present it is about 15 minutes.

Socialization. During an observation period in early fall, Child 1 paid little attention to teacher directions. He did not answer roll call and was persuaded to join in the singing of a Halloween song only when allowed to shout the "boo!" whenever it occurred in the song. He made several attempts to contact a classmate in the "time-out" room and persisted in trying to get into the room for two minutes, during which time he climbed up on a stool and used a ruler to get the key.

At the start of the year, the child typically carried a ruler with a wooden disc at one end. If these specific items were not available, he would substitute other materials, preparing an object of similar shape and configuration. He would appropriate materials needed for his symbol and, when frustrated in this or

other activities, would scream, undress, urinate, defecate, and spread stool.

Since he recognized the legitmacy of controls on behavior ("have to get quiet"), a goal of increasing the amount of behavior under verbal control of the teacher was identified, particularly to reduce his undressing, urinating, defecating, and stool spreading when frustrated. Teacher strategies were to a) give directions in a positive manner, preferrably in a quiet, removed location, b) whisper directions if they have to be given in a group setting, c) give short, simple directions, and d) pretend the direction is coming from a hand held puppet. After about one month of this strategy, the urination, defecating behavior was all but eliminated. With respect to adults, he was relating on Ruttenberg's and Wolf's level 1, but progressed to level 3.

Child 2

Language. In a fall language sample at the beginning of the child's second year in the school, Child 2 spoke an average of once every six minutes. There was one use of the word "I." "Mommy" and "Dad" were referred to several times. One teacher was addressed, but none of his classmates were named nor addressed. About 20 percent of the utterances were short sentences using present tense verb forms. Teacher goals were to a) increase language production, b) differentiate and use present progressive and past tense, and c) strengthen identification of others, particularly classmates. In academic and other activities, teachers focused on describing the activity using present

progressive tense in a complete sentence and using past tense in a complete sentence when the activity was finished. Further, the child was praised verbally for sentences having N-V-N combinations with correct verb tense. To strengthen his identification of others, he played "mailman," delivering letters and packages to classmates and conducted "Man-on-the-Street" interviews. Also, Child 1 placed on Lee's (1974) wh-question words; who, what, and where (all two-scoring words on an eight-point scale). The child is handed pieces of doll furniture and asked the wh-questions as he places the piece in the doll house.

In a language sample taken midwinter, he spoke an average of more than once a minute. Vocabulary words appeared to be simple and included colors, names of coins, and numerals. The most complex sentence (fall sample) was, "This is a pen in Meg's hand." The most complex utterance in the winter sample was "Jimmy and his family go to Ponderosa (for) hamburger, french fries, chocolate drink." In both fall and winter, about 20 percent of the utterances were in complete sentences. The biggest change was a reduction in single words with an accompanying increase in constructions.

Comparison of the results to Lee's table for normally developing children indicated Child 2 to be functioning at lower than a two-year level.

		Single Words	Two-Word Combinations	Constructions	Complete Sentences
Normal Child	(2-0 to 2-2)	18%	21%	18%	43%
Subject	Fall	43%	15%	18%	23%
	Winter	37%	15%	28%	20%

Academic. In one observation period in October, the teacher told Child 2 to write his name and the date on the paper. Before he completed this assignment, his attention strayed (He started making noises which could not be interpreted.). He had to be reminded twice more and threatened with loss of the calculator privileges before he got his name and the date written. After about two minutes work on arithmetic problems, he again had to be returned to his seat, this time with the calculator. Using the calculator, he did ten addition problems before starting to suck his thumb. Altogether, he worked about 15 minutes on his academic assignment.

Since Reading Comprehension was substantially lower than Recognition (see Peabody Achievement Test Scores), strategies to improve comprehension were implemented; eg., he was asked questions about a story that he had read or a record he had heard. All errors were corrected on the spot with instruction.

In view of his interest in the calculator, arithmetic was stressed. During the school year, he mastered enumeration (apparently with a good grasp of one to one correspondence) and matching numeral and quantity.

Strategies to reduce his wandering and increase his attention span included making sure the child was looking at teacher when a direction was given (holding head if necessary), repeating teacher direction, and continuing to repeat until the child carried out the teacher direction. If he became silly, angry, or withdrawn, he was ignored until he became more responsible and was then given the teacher direction again. During the

year, his attention span increased to the point that he could listen to an entire short story without leaving his seat.

On the Peabody Individual Achievement Test, Child 2 scored in the 68th percentile in Reading Recognition, 10th percentile in Reading Comprehension, and 50th in Spelling. He did not score high enough to get a percentile rank in Mathematics and General Information.

Socialization. In the fall, typically, Child 2 wandered aimlessly around the classroom. He talked to himself, sometimes about his mother, and occasionally about fantasy people or comic book characters. He twisted his hair in a compulsive manner and banged his head. He returned to the classroom only partially dressed after toileting. In a few weeks, his non-adaptive behavior was reduced (This is the student's second year in the school.) to the point that he was given a trial in a Learning Disabilities classroom. However, the trial was not successful and he was returned to the autistic classroom. He tolerated the head teacher at close range for very short periods of time, but withdrew his attention, acted "silly," struck out, and ran away. Initially, his adult relations were on level 3. They are somewhat stronger, presently at level 4.

Child 3

Language. Echolalia and perseveration were extensive when Child 3 entered school in the fall of 1973. However, speech improved steadily during the year. By the spring of '74, his spontaneous speech was in phrases and short sentences; eg.,

"Take out the paste and glue the paper." He understood both past and present tense and was beginning to appreciate future time. Echoing had been reduced at least 50 percent. Perseveration was also much reduced.

At the beginning of his second year in the school, the child spoke an average of once every four minutes. At least 75 percent of his utterances were spontaneous. "I" was used repeatedly; eg., "I am" (9a), "What am I going to buy with it?" (9c), "I want something out of the sack" (9b). Other pronouns or noun modifiers and Lee scores were: we (3), they (3), all (3), it (1), this (1), you (1), who (6), and one (3). Main verbs were scored 1 or 2 except for "shouldn't have done that" (8). Simple infinitives, eg., "to buy," and "to get" (3) were present. Wh-questions included "what" (2), "how" (5), and "who" (2). According to Lee's standards, he was using more two-word utterances and fewer complete sentences than the normal child of 2-0 and 2-2.

	Single Words	Two-Word Combinations	Constructions	Complete Sentences
Normal Child (2-0 to 2-2)	18%	21%	18%	43%
Child 2 (fall)	20%	44%	21%	15%
Child 2 (spring)	3%	6%	6%	85%

Goals were to increase quantity and quality of verbal production. Strategies included 1) stimulating ordinary two-person conversation, 2) describing student activity using "I" with present progressive and past tense as appropriate, 3) repeating student's correct use of tense with verbal praise, 4) use of puppets and doll

house to stimulate story telling, and 5) role playing fireman, policeman, etc., using hats and other paraphenalia.

In a language sample taken in the spring, he spoke about once a minute, almost always spontaneously. About 85 percent of his utterances were in short (4.7 words) sentences. Sentences were usually simple, consisting of a noun (occasionally a pronoun), a present-tense verb, and a simple predicate. However, examples of past, present progressive, and future tense were liberally sprinkled throughout. As far as the Lee values were concerned, a 4-scoring "nothing" and ten 3-scoring infinitives appeared.

Overall, there was solid evidence that the teacher strategies were effective in promoting use of present progressive and past tense as well as in speaking in complete sentences.

Academic. On the Peabody Individual Achievement test, Child 3 scored in the 2nd percentile on Reading Recognition, and in the 10th percentile in Spelling. Overall, he scored at the 0.7 grade equivalent. The Reading goal for Child 3 has been to read two and three word sentences. Teacher strategy was for the student to tell what words he wants in the sentence, teacher writes each word on a different card, student sorts cards and places cards to make a sentence in the form of noun-verb-noun. His initial writing objective was to write the letter k without assistance. Following successful completion of the first objective, a second objective, ie., to print his name in lower case letters, was chosen. The arithmetic objective has been and remains to learn addition facts, and sums to 10. The magic number approach is used. The student picks a number from one to ten (the magic

number) and then finds the set of numbers whose sums total the magic number.

Socialization. In the fall of this school year, the child needed assistance with toileting. After about one month of instruction, this need has been met and another socialization objective, ie., to eliminate bizarre hand movements and throat sounds, was identified. Teacher strategies were to ignore the bizarre behavior and reinforce the desired behavior with candy dot and a statement such as "You look good with your hands relaxed." The hand movements have all but disappeared. The child is being reinforced less frequently and with more social reinforcers, ie., a short tussle or wrestling period with the teacher. His adult relationship has moved from level 7 to level 8.

Child 4

Language. In late October, Child 4 spoke on the average about once a minute. The personal pronouns "I" (1), "You" (1) and "We" (3) were used frequently. The names of classmates were used; occasionally, the full name. Present, present progressive, and past tense verb forms were used appropriately as well as one infinitive, "to go" (3). "What" and "where" were also evident.

The primary language objective was to get the student to speak loudly enough so that others could easily understand him. To promote this, he was aksed questions; particularly questions which require a description. Initially, he was reinforced with candy for every response. Reinforcement was gradually reduced, until currently, he receives candy only when the response is

loud and clear enough to be understood. He was encouraged to read aloud to another child. Taped interviews with the teacher were played back. Language production was more than doubled by early February. Further, there was a significantly greater percentage of the utterances in longer phrases and sentences. The most advanced sentence was "Put all the clothes on down to the shoes."

		Single Words	Two-Word Combinations	Constructions	Complete Sentences
Normal Child (2-0 to 2-2)		18%	21%	18%	43%
Child 4	October	68%	14%	8%	10%
	February	28%	21%	18%	43%

Academic. In October, Child 4 could print the names of his classmates using upper and lowercase letters. He could write his own name in cursive. He spelled and printed the words "saw" and "needle" on the board. He was studying words with the initial consonant "h." In arithmetic, he could count aloud beginning and ending with a given number, but was having problems with one to one correspondence. He had a maximum attention span to academic work of about 20 minutes. The conclusion that arithmetic needed relatively more attention than reading was supported by the Peabody. By spring, he had mastered one to one correspondence, sums to 10, and was beginning subtraction.

On the Peabody Individual Achievement Test, he placed at the 47th percentile in Reading Recognition, and the 28th in Spelling. He was unable to score in Mathematics, Reading Comprehension, and General Information. Overall, he had a grade equivalent of first grade, first month.

Socialization. Child 4 has good self help skills. He was being encouraged to participate freely and fully in group activities, and currently plays with another child or in a group. His relations with adults improved from level 6 to level 8.

Child 5

Language. In a three-hour language sample taken in the fall of 1974 at the beginning of his second year, he spoke an average of once every three minutes. About half of the responses were spontaneous. Almost all of his utterances were one word in length. On two occasions he used a two-word phrase, a) tie shoes, and b) said no. There was no reference to self nor were any pronouns used. All other students and one teacher assistant were named. Some of the teacher strategies to develop self-identification were a) matching photographs of classmates with their names (including his own), b) making water color or crayon pictures of self, and c) playing doll house with teacher assistant using puppet of self. Making and receiving calls over the play telephone was another strategy employed for the same purpose.

In a spring language sample he spoke 24 times an hour, about one-third spontaneously. He used 12 nouns in the fall sample, 41 in the winter. In the fall sample, he named three foods; in the winter sample, seven; all different from the first three. The only animal named in the fall sample was dog; the winter sample contained the names of seven additional animals: bear, lion, duck, bird, fish, cat, and butterfly. Although there were no references to means of transportation during the fall sample, the winter sample contained six: boat, plane, train, truck, bus,

and car. The fall sample contained only two colors: red and blue. The same colors plus orange, brown, black, and purple were in the winter sample. Other nouns used during the winter but not the fall session may reflect a somewhat better orientation to time and place; particularly home, closet, picture, outside, bridge, and store. There were no self referrents nor any indication of an understanding of self-possession. At this time, there was disappointingly little evidence that strategies were successful in the development of self image or self identification. Overall, it appeared that language growth was parallel rather than longitudinal.

Academic. Child 5 was observed in October of 1974. Given cutouts of the first names of classmates and teachers, he correctly placed the cutout over the outline of eleven names in one minute. Similarly, he placed numerals over their outline and when asked, repeated the numerals. Child 5 can count, but the counting appears to be by rote and dependent upon the material. Apparently, he had not developed concepts necessary for enumeration of any set of objects. Overall, he worked about seven minutes at academic tasks, although he frequently left the area and had to be called back. He was reinforced with gold stars. When he had ten stars, he was allowed to listen to a record. His attention time was gradually extended until currently, the teaching goal is to maintain attention to academic tasks for 15 minutes. He is given sips of soft drinks for reinforcement of the "sitting still" behavior.

Socialization. The primary objection in the socialization area was to gain cooperation with teacher-directed tasks, particularly to tolerate the presence of the teacher. When first admitted to the school in the fall of '74, Child 5 was functioning at Ruttenberg and Wolf's level 1 insofar as an adult relationship was concerned. He was oblivious to people, and when the teacher tried to move him into physical proximity, he would run away, bite, hit, scream, or kick. The teacher would move as close as possible (six feet) while he was listening to the record. She would position herself closer within the limits of his ability to tolerate her presence. If he responded negatively with gestures, his behavior was ignored. If he attacked physically, he would be taken to the time-out room. The teaching strategy was to award gold stars for cooperation and allow the child to listen to a record when he had accumulated ten stars. The number and quality of the assigned tasks was gradually increased as was the ratio of tasks required for a star. The distance was gradually reduced to three feet, and finally the teacher was able to listen to a record through a second pair of ear phones. By spring of '75, Child 5 was attending to the teacher's face at times when the teacher's attention was directed elsewhere. Child 5 approached, but retreated if the teacher turned her attention to him. By spring of '75, Child 5 moved from Ruttenberg and Wolf's level 1 to level 4.

Child 6

Language. In a language sample taken in the fall beginning of the second year in the school, she spoke only about ten times

an hour. There was a single use of the word, "I," "me," and her own name. There were no other references to individual people, either classmates nor instructors. While the majority of her expressions were one word in length, she did use short, complete sentences, the most advanced and repeatedly used being "Leave me alone."

Since the child had a very low level of language production and an apparent weak self-identity, teaching strategies focused on increasing language production, strengthening ego and self-identity. Initially, the child sat facing the teacher, and was given a candy dot each time she correctly answered "What is your name?" The teacher placed the child's hand on the child's chest to further the concept development. The naming and touching procedure was then extended to include the teacher and the teacher's name. Post office, a game in which she receives letters with her name on the envelope, was used.

Academic. Academic exercises included placing the letters of her name on an outline of her name, using magnetic letters, felt markers, paints, cutouts, etc., to write her name. The speech therapist was particularly successful in eliciting verbal responses associated with eating, e.g., child repeated the activity as she carried it out--open the cereal, pour the cereal, close the cereal, etc. She spoke 60 times per hour in the February sample. The single word utterances were reduced; the two word utterances and complete sentences were increased. Even though improved, the distribution did not compare with that of a normal two year old.

	Single Words	Two-Word Combinations	Constructions	Sentences
October	42%	17%	10%	31%
February	34	22	10	34
Normal Child (2-0 to 2-2)	18	21	18	43

While in October only six different nouns were used, in February, 24 different nouns were spoken, ten of these referring to food or eating. Open, pour, and close were used repeatedly in February. The most advanced sentence spoken was, "What should we do with those things?" She used her own name four times, three of these times in complete sentences. She spelled her own name, used "I" four times, "me" once, "we" four times, and finally, "you" three times. It was concluded that speech production has been increased with an accompanying increase in percentage of complete sentences. Also, self and other person identification had been improved.

Socialization. At entrance to the School for Autistic Children, she sat quietly in a rocking chair and refused to become involved in any activity. When directed by the teacher to sort plastic bags by color, she sorted for about one minute and then poured the pegs container to container for another minute. During the ten-minute session, she left her seat four times. When the teacher directed the student's face to facilitate eye to eye contact, the child screamed, laughed, and ran away. At this time (fall of the year), Child 6 was relating to adults on Ruttenberg and Wolf's level 3.

The areas where it was easiest to get her cooperation revolved around food. She appears to be in her pre-adolescent growth spot, and although she entered this phase growth retarded, she now appears to be making up for lost time. The teaching strategy to improve relations with adults included having to help prepare foods (juices, cookies, puddings) set the table, sort and count food boxes, and shop in a "food" store. Her relationship with the teacher assistant in the "kitchen" gradually improved. Recently, she asked for a hug and called the teacher assistant by name and told her that she loved her. Currently, she is asking questions of the sort, "What shall we do?" She is functioning on level 7.

Child 7

Language. Child 7 entered the project school in fall of 1973. He was functioning on Ruttenberg and Wolf's level 1 in expressive speech development. Teacher strategy to encourage language production was to sit opposite the student with the student's legs imprisoned between the teacher's, reward the student with food for looking at the teacher, and reward any approximation of his own name. Another technique is for the teacher to roll a wooden car on the floor. When the student notices, the teacher calls his name and the word "roll." If the student rolls the car, he is reinforced with a candy dot or a hug. Waterplay has been of strong interest, so he is encouraged to "open" and "close" the water faucet. He is currently making an "m" sound and is functioning on level 2.

Academic. At the time of entry to the project school, Child 7 paid no attention whatsoever to academic tasks. Now Child 7 can correctly place the Sterne arithmetic blocks (colored) into the form board and place the numeral at the top of the column in about two minutes. Reinforcement is a smile or a hug. When given cutouts of the names of class members and teachers, he was able to place three of them over the outline of the names. The three correctly-placed names each had three letters and the word had the same shape. Again with social reinforcement, he made a letter "M" which covered an 8½ by 11 piece of paper.

Socialization. When Child 7 entered the School, he spent most of his time rolling on the floor. He repeatedly ran out of the classroom. He vocalized in some way almost continually, at least 90 percent of the time. He kicked, screamed, and waved his arms. He was completely oblivious to the presence of teachers and other children. He would wolf his food down with his hands and run away from the table. He was constantly putting non-edibles into his mouth. By the end of the first year, the kicking and screaming had been reduced and he could go without putting non-edibles into his mouth for a couple of hours.

At the beginning of the second year, most of his day was spent pacing around the room in what appeared to be a random pattern. He occasionally put it down. Occasionally, Child 7 would try to use a screw driver, but only momentarily. He would spend some minutes at the sink with a sponge, soap, and water. He rocked himself. A few times a day, he would seek to be hugged, held, or rocked by one of the teachers. Ordinarily, he did not

eat at the table with the other students, nor did he take any notice of them.

When upset, he cried, moaned, screamed, rolled on the floor covering his head; particularly the ears, and tried to get under the rug. This behavior occurred several times during the day, lasting from ten to twenty minutes. When in the isolation room as a result of this type of behavior, he ate plaster. Currently, though, the frequency of his non-adaptive behavior has decreased, and he definitely takes notice of other children. He tried to help another student dress. In terms of relationships with adults and other children, he has moved from level 1 to level 2.

Child 10

Language. In the fall of 1974, Child 10 correctly pronounced and appropriately used ten words; 7 one-syllable words and 3 two-syllable words. He also named the numeral "2" and the letters "t" and "r" co-rectly. By March, he could correctly name the letters "a" through "k", consonants, and vowels in all positions within the word.

Fall Sample. The letter "w" was missed once initially and once terminally; in "regon" for wagon, and "yellah" for yellow. Five missed initially-placed consonant blends were as follows:

Initial Consonant Blend	Child 10's Word	Intended Word
th	da	the
tr	luck	truck
st	dar	star
bl	bah lah	blue
ch	hair	chair

Final consonants m, s, d, e, and t as well as the blend ck posed problems.

Final Consonant or Blend	Child 10's Word	Intended Word
m	cree	cream
s	buh	bus
t	heh	hat
	lah	light
ck	blah	black
d	reh	red
l	bah	ball

Consonants p and n were problems terminally and medially.

Consonant	Child 10's Word	Intended Word
p	arhcane	airplane
	stah	stop
	ah ple	apple
n	bah na	banana
	brow	brown

Also missed were vowels o and e as in "dar" for door, and "bethroom" for bathroom.

There were inconsistencies, and the sounds were not invariably missed. For example, the tr in truck was missed, but not in tree. Although the medially and terminally placed p was missed, pear was correct. Other correctly pronounced words were green, moon, baby, go, butter, cow, two, and ruler.

Spring Sample. Except for the ability to name letters of the alphabet, the spring language sample resembled the fall sample. Further, the consonant blend br was omitted in umbrella and broom. The initial s was omitted in sweeper and swing. Terminal consonants and second and higher syllables were very frequently substituted.

Socialization. Child 10 is a rather quiet child. When upset, he whines, flaps his hands and arms, spins himself, and occasionally sucks his thumb. When very upset, he hits himself, particularly on the thigh. He hit himself with the teacher's hand when unable to do exercises. He had little eye contact and for the most part, existed in his own world. Child 10 pays no noticable attention to other students. He gazes, lacks self-identification, and pays little attention to his own name.

In late October, he began to enter the playground games for a few moments at a time. By January, he was seeking out one of the teachers and showed a preference for being seated next to her. If so seated, he will sing songs with the rest of the group. On the Ruttenberg and Wolf scale for relations to adults, he moved from level 1 to level 6.

Child 11

Language. Child 11 had no language in the fall and has developed none.

Academic. Child 11 sorts bottle caps and pegs by shape and color. He became frustrated and started to shake and run away when he was unable to sort caps by printing on the cap.

Socialization. In the fall, Child 11 appeared to be out of contact with reality a good part of the time. A large boy, he sat or stood in a stooped position. He shuffled along, hugging the wall with head down and face averted. His mouth was almost always open, he drooled, picked his nose, wiped his nose on his sleeve, and frequently and for no apparent reason, laughed and

grimaced. When he arrived in the morning, he appeared to be bordering on a stupor, but was somewhat more alert after exercise. He seldom initiated an activity and tended to remain in the same place for relatively long periods of time. Child 11 appears to have a flat affect. He giggled quite inappropriately and "made faces." In the fall he took advantage of every opportunity to run out of the room, especially to run up the stairs and peer down over the stairwell. When an adult tried to stop his running away, he would hit them and try to overpower them. By late November, he tended to remain in the room longer, but would still occasionally leave to search for chalk and erasers. He gradually became more cooperative and willing to try to do the assigned tasks. Currently, he seems to be seeking out a particular teacher assistant. In the area of relationship to adults, he has moved from level 1 to level 4.

Body Management. In September, it was difficult to get Child 11 to participate in exercises or games. He reluctantly took a place in the circle and frequently broke away. There was no indication that he heard or followed instructions. He had to be passively moved through such exercises as "Angels in the Snow." He stood motionless while the class did jumping jacks. He could not catch the ball while standing, although he would pick it up and throw on command after two or three seconds if the teacher called his name and established eye contact.

By mid-January, Child 11 was willing to take a place in the class circle, rarely breaking away. Lying on his back, with the teacher standing directly over him giving verbal commands, Child 11

sat up and touched his toes six times. Once Child 13 and Child 11 had a friendly contact.

There was little right-left dominance. He used both hands while at the blackboard making circular patterns. He used his right hand to draw on the right side of the board and his left hand to draw on the left side of the board.

Child 12

Language. In September when school opened, Child 12 had no language, although he made almost constant throaty noises. By mid-January, he spoke the single word "up" clearly and with good tone. At this time, he was also saying "o" and associating the sounds of two consonants b and d with the letters. By March, he associated sounds with the vowels a, i, and o, and the consonant p. Further, he could produce a reasonable sound for the r in bird and horn (ahhr and ahr). Finally, he spoke his second correct word, "mamma." In the fall, he was in the Ruttenberg and Wolf expressive level 1; by spring, level 4.

Academic. On admission he could arrange cards with the natural numbers from 1 to 100 in correct order. While in a one to one situation with the teacher, he correctly sorted black and red pegs. Given large felt capital letters (not in order), he correctly place U, B, and S in an outline of the word, "bus." He worked about six minutes on the arithmetic-oriented tasks and about three minutes on the reading-oriented tasks. In October of 1974, he recognized colors, could apparently count silently to 100 and recognized a few letters of the alphabet. His maximum attention time to academic materials was less than ten minutes. Child 12 uses crayons to draw lines from left to right and from top to

bottom.

Socialization. When Child 12 entered school, he appeared to have little contact with reality. Whenever permitted, he took a position near the window and stared into the street becoming excited at the sight of a bus or truck. Every minute or so he would put his hands to his face, covering both eyes and ears as if to cut off input from both of these sensory channels and scream, grimace, and jump.

The child was observed carrying out this maneuver ten times in a fourteen minute academic teaching session, and 16 times in a twenty minute physical education session in October. It was frequently necessary for the teacher to place on hand under his chin, verbally command his attention, and direct his gaze in order to interrupt his maladaptive behaviors. Child 12 took no notice of other children or the teachers. As far as degree of relationship to an adult as a person, Child 12 was functioning on level 1 in September, 1974.

By mid-January, Child 12 sought out one of the teachers and would seat himself on the floor facing his favorite teacher and maintain almost constant eye contact with her throughout a group activity. He smiled when recognized by the teacher and would occasionally bring his face as close as possible to hers. He folded her fingers down in the Ten Little Indians game. He seemed much happier, more in contact, and his episodic behavior much less frequent. In one 20-minute activity session in January (songs and exercises) only twice did he cover his eyes and ears. Although initially, he

would run to the window every few minutes, by mid-January, he gladly remained with the class for the full period. He made rhythmical clicks and performed arm and leg movements that accompanied the songs with other students. By spring, he was functioning on level 6 in relationship to an adult.

Body Management. In the early fall, Child 12 could catch the ball with both hands if his attention was called before it was thrown. He could also push the ball away from him. If started passively, he could maintain the arm movements in Angels in the Snow for a few seconds. Seated on the floor with knee flexed and ball placed at his foot, in one series of tries it took 60, 90, 50, 30, 10, 35, and 10 seconds for him to kick the ball on command. Every successful kick was reinforced, usually with potato chips. Overall, lower body control was poor. He did not skip, jump, do leg lifts, or move legs in Angels in the Snow. By mid-October, he was jumping over low objects and by mid-January, was independently initiating and maintaining patterned arm and leg movements. He could not, however, move arms and legs simultaneously in patterns such as Angels in the Snow. There was no right-left dominance noted.

Child 13

Language. Child 13 is quite verbal. He spoke 50 times in one fifteen minute period, almost exclusively in complete sentences and approaches an average of five words per sentence. One of his most complex sentences was, "What did he say when you told him?" Using the Laura L. Lee scoring system, his language development was comparable to that of a child of six years, three months.

Academic. He could count by tens when he entered school, but did not know the value of coins. His comprehension of a story, either read to him or by himself, was very poor; e.g., he could not answer the workbook questions after reading the Three Little Bears. When asked a question about an event or character in the story, he would make wild guesses. Reading comprehension was improved after the teacher questioned the student on each paragraph. He works from third grade tests.

Socialization. Child 13 carries on dialogue, relates well to other students and teachers, and shows concern when they are absent. He obviously enjoys almost all school activities. He attends gym class and eats in the cafeteria with students in other classes. He helped other students from the taxi to the classroom on occasion. He does, however, tend to "tattle" on other children. He goes on errands such as to the principal's office and school cafeteria alone. He has good eye contact, is pleasant, cooperative, and accepts correction. He assisted in selection and purchase of a bird, and assumes responsibility for care of the bird. He has all the necessary toileting and dressing skills.

Body Management. Child 13 can catch and throw a ball easily and from any direction. He is able to kick with a soccer-like kick. Further, he likes to try "trick" shots with the ball. He can do double somersaults and Angels in the Snow. In October, he could do jumping jacks with short little jumps and arms waving. After about one month, he did jumping jacks very well. He walks, runs, skips, and jumps, and can balance on one foot, but not hop on one foot. He goes over and under obstacles watching carefully

not to bump. In January, he was still reluctant to cross his legs or sit Indian style on the floor. Also, he was slow to do exercises involving simultaneous movement on one side of the body.

Overall, Child 13 seems to be exhibiting few signs of autism.

Child 14

Language. In the fall of 1974, Child 14 spoke only once every two minutes. He echoed the statement, "I hate bologna," and the third time said, "I still hate it." He repeated "I'm trying to work," twice and "Never" four times. In general, everything that he said was repeated at least once and as in the case above, four times. He used complete sentences, the longest of which was "Could I have my typewriter now?" His voice has a hoarse quality. Once while working on arithmetic he was heard to say "I made a mistake. That's a toughie."

By mid-winter, the perseveration was reduced. In March, Child 14 responded verbally in a group activity. Specifically, he picked a song, but asked that everyone leave before he sang his selection. He was beginning to verbalize his feelings as illustrated by a short exchange during math class in which the child threatens to "get even" with the teacher. Child 14 starts to tear the paper and when the teacher stops him:

Child 14: "Blah! Blah! One more time. If you shout again, I'll spank you. Anti-lib! Women's Libber!"

Teacher: "What?"

Child 14: "Unfair to men! I'll tell you one more time. If you say no, I'll show anger!"

Teacher: "There is no need to get mad. You know you're not to waste paper like that, no."

Child 14: "I'm going to show anger."

Teacher: "Why?"

Child 14: "If I hear one more shout, that will end your career at Schiel." (He starts to tear the paper again.)

Academic. Child 14 can do multiplication problems with two-digit multiplicands and single digit multipliers. He also has an understanding of improper fractions. He can do a problem such as 57 x 5, double, and add 1 in his head. He prints and although his work is not necessarily neat, does fourth grade work using the adopted texts. On the Peabody Individual Test, Child 14 scored:

Subtest	Grade Equivalent
Mathematics	10.3
Reading Recognition	8 6
Reading Comprehension	4.5
Spelling	7.1
General Information	3.2
Total Test	5.8

Socialization. Child 14 bites his nails, hands, and arms. When frustrated, he will roll on the floor, jump up and down, and scream. He is easily frustrated and displays such behavior, for example, when asked to use a pencil instead of a crayon. He tends to have temper tantrums; especially if his work is corrected. He fantasizes particularly about sports and gambling games. During the year his non-adaptive behavior has been substantially reduced and his relationship to adults improved, probably from a level 2 to a level 7, although this tends to vary from day to day.

Body Mangement. A large, overweight boy, he is lethargic, tires easily, and has to be encouraged to participate in physical activities and will exercise for a short time only. When admitted, he could throw, catch, and kick the ball, making the ball travel

in any direction he chose. He does "trick" shots and rarely misses a kick. Arm and leg movements in jumping jacks and "angels" were not coordinated nor could he hop unassisted.

By mid-November, he could do Angels in the Snow with the teacher giving the "open-close" directions. By mid-December, he could jump a few inches off the ground with the aid of a chair. By January, he could jump 60 times. He also could do jumping jacks rhythmically, although one at a time.

Child 15

Language. Child 15 has a low level of language production. In a language sample taken in the fall, echolalia was the outstanding feature, with as many as three repetitions of sentences or phrases. In a few instances, the echolalic phrase was included in the answer to a direct question, e.g., "Have you every played this before?" Answer, "Yes, I have played this before." Almost the entire fall sample consisted of rephrasing and repeating phrases and sentences spoken by the teacher. Asked to identify 37 common objects, he correctly named 25. He did not name elephant, dog, nuts, horse, thistle, lion, or ice, and called a bird a fish. Echolalia was considerably reduced in the spring language sample. He appears to be using language to express his own ideas and is not so completely tied to the reflection of other's statements as previously. For example, he says (without being addressed) "Now you sit down and talk to me." Another example. He says to another student, "You're fat."

Academic. On the Peabody Individual Achievement Test, Child 15 had a grade equivalent of 1.0 in Reading Recognition, and 0.7 in Spelling.

Socialization. Initially, Child 15 was silent, withdrawn, and sad, doubtlessly due in part to the recent death of his mother. He would start to cry, and when asked why, would respond that he was worried about himself. His withdrawn behavior was gradually reduced until during morning singing and exercising in January, he sat next to one of the teachers, had eye contact with her, and appeared to enjoy being near her. When it was his turn, he started a song and particularly enjoyed "Someone's in the Kitchen with Dinah," singing all the way through. His relationship with adults has improved from level 7 to level 8.

Body Management. Child 15 walked and ran in the fall with reasonable facility, but could not skip nor hop. When trying to skip, he would lead with his head, contort, and fail to alternate arms. Although he could not do so in September, he did Angels in the Snow by himself in late October. He can throw and kick the ball, but has some difficulty catching, usually scooping up the ball with his arms. He tends to walk in a rectangular shape on the playground. In December, in one song "If you're happy. . . touch your knees. . . toes. . . head. . ." he carried out all of the motions on his own.

Recommendations

Overall, it appears that teacher strategies were effective in promoting development in all areas. For the non-verbal child, action-response activities and manipulative materials appear to be more

effective than reading and writing activities. It is recommended that a sequential series of manipulative materials be identified and tried with these children in a research oriented design.

Student 7 made the least progress in all areas, although in his second year in the school. Student 13 has few of the characteristics of the typical autistic child. It is further recommended that both of these students be reviewed by staff in terms of best possible placement within the system.

Summary

Thirteen children were admitted to the School for Autistic and Children during school year 1974-75. Students were in two classes, each with a head teacher and two teacher assistants. A speech therapist worked part-time with one class. The purposes of the School were to identify teacher strategies which promote the language, academic, social, and physical development. Tools used to assess status and indicate direction of change in language development were 1) Ruttenberg and Wolf's scale for evaluating vocalization and expressive speech development and 2) Laura L. Lee's Developmental Sentence Analysis and Scoring. Relationships with adults were assessed using another Ruttenberg and Wolf scale. Also, every child was tried with the Peabody Individual Achievement Test. Finally, all students were observed in the classroom and antecodotes recorded. The staff and Autistic Advisory Team studied each child, determining goals and teacher strategies on the basis of language sample, achievement test, and other reports. Several innovative strategies were tried. Overall, students made

progress in all areas, although of varying degrees. For non-verbal students, strategies focusing on manipulative materials and action-response activities appeared superior to reading and writing activities in promoting language and social development. More research oriented approach to the problem of identifying successful teacher strategies should be incorporated as the project matures and resources permit.

Approved:

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